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EXAMINER	
LEWIS, DAVID LEE	
ART UNIT	**PAPER NUMBER**
2629	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/23/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	09/716,885	SATAKE, RUMO	
	Examiner	Art Unit	
	David L. Lewis	2629	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 December 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-41* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-41* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *2/17/2006*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. **Claims 1-5, 10, 17, 18, 23, 26, 27, 32, and 35-41 are rejected under 35 U.S.C. 102(b) as being anticipated by Nito et al. (5214523).**

As in claim 1, Nito et al. teaches of a method of driving a liquid crystal display device, said liquid crystal display device including: an orientation film over a substrate, **column 3 lines 52-67, column 7 lines 30-45**;

said liquid crystal material over the orientation film, said liquid crystal material having a chiral smectic phase, **column 3 lines 5-10**,

wherein a brightness of said liquid crystal material increases monotonically according to an increase of a voltage value applied to said liquid crystal material, **column 8 lines 63-67, column 9 lines 1-40**,

and wherein the liquid crystal material has an approximately V shaped electro-optical characteristic, **figure 10, table 1, column 9 lines 18-45**

the method comprising displaying a first black level by the liquid crystal material in a first period, **figure 9a & b**;

applying a first voltage to the liquid crystal material for a first gradation display in a second period just after the first period**, figure 9a & b, column 9 lines 1-40.**

displaying a second black level by the liquid crystal material in a third period just after the second period, **figure 9a & b**;

and applying a second voltage to the liquid crystal material for a second gradation display in a fourth period just after the second period, **figure 9a & b, column 9 lines 1-40**.

Wherein Nito shows in figure 9b a series of incrementally increasing gray scale pulses having a first and second portions of equal magnitude but opposite polarity, each pulse followed by the application of zero volts, such that gray scale pulses cause a corresponding gray illumination and the zero volts cause a black display which cancels polarization. Therefore Nito teaches of a sequence of

applying zero voltages in a first period, followed by a two polarity gray scale pulse in a second period, followed by applying zero volts in a third period, followed by applying another incrementally higher two polarity gray scale pulse in a fourth period, followed by another zero volts in a fifth period, totally reading on the Applicants claimed invention.

As in claim 2, Nito et al. teaches of a method of driving a liquid crystal display device, the liquid crystal display device including: an orientation film over a substrate, **column 3 lines 52-67, column 7 lines 30-45**;

the liquid crystal material over the orientation film, said liquid crystal material having a chiral smectic phase, **column 3 lines 5-10,**

wherein a brightness of said liquid crystal material increases monotonically according to an increase of a voltage value applied to said liquid crystal, **column 8 lines 63-67, column 9 lines 1-40,**

and wherein the liquid crystal material has an approximately V shaped electro-optical characteristic, **figure 10, table 1, column 9 lines 18-45,**

the method comprising canceling out a spontaneous polarization of the liquid crystal material in a first period, **figure 9a & b, column 9 lines 1-40**;

and applying a first voltage to the liquid crystal material for a first gradation display in a second period just after the first period, **figure 9a & b, column 9 lines 1-40**.

canceling out the spontaneous polarization of the liquid crystal material in a third period just after the second period, **figure 9a & b, column 9 lines 1-40**;

applying a second voltage to the liquid crystal material for a second gradation display in a fourth period just after the third period, **figure 9a & b, column 9 lines 1-40**.

Wherein Nito shows in figure 9b a series of incrementally increasing gray scale pulses having a first and second portions of equal magnitude but opposite polarity, each pulse followed by the application of zero volts, such that gray scale pulses cause a corresponding gray illumination and the zero volts cause a black display which cancels polarization. Therefore Nito teaches of a sequence of applying zero voltages in a first period, followed by a two polarity gray scale pulse in a second period, followed by applying zero volts in a third period, followed by applying another incrementally higher two polarity gray scale pulse in a fourth period, followed by another zero volts in a fifth period, totally reading on the Applicants claimed invention.

As in claim 3, Nito et al. teaches of a method of driving a liquid crystal display device: the liquid crystal display device including: an orientation film over a substrate, **column 3 lines 52-67, column 7 lines 30-45**;

and a liquid crystal material over the orientation film, said liquid crystal material having a chiral smectic phase, **column 3 lines 5-10**,

wherein a brightness of said liquid crystal material increases monotonically according to an increase of a voltage value applied to said liquid crystal, **column 8 lines 63-67, column 9 lines 1-40**,

and wherein the liquid crystal material has an approximately V shaped electro-optical characteristic, **figure 10, table 1, column 9 lines 18-45,**

the method comprising applying a voltage of OV to the liquid crystal material in a first period, **figure 9a & b, column 9 lines 1-40**;

and applying a first voltage to the liquid crystal material for a first gradation display in a second period just after the first period, **figure 9a & b, column 9 lines 1-40**.

Applying a voltage of 0V to the liquid crystal material in a third period just after the second period, **figure 9a & b, column 9 lines 1-40**;

Applying a voltage to the liquid crystal material for a second gradation display in a fourth period just after the third period, **figure 9a & b, column 9 lines 1-40**.

Wherein Nito shows in figure 9b a series of incrementally increasing gray scale pulses having a first and second portions of equal magnitude but opposite polarity, each pulse followed by the application of zero volts, such that gray scale pulses cause a corresponding gray illumination and the zero volts cause a black display which cancels polarization. Therefore Nito teaches of a sequence of applying zero voltages in a first period, followed by a two polarity gray scale pulse in a second period, followed by applying zero volts in a third period, followed by applying another incrementally higher two polarity gray scale pulse in a fourth period, followed by another zero volts in a fifth period, totally reading on the Applicants claimed invention.

As in claims 4, 17, and 26, Nito teaches of, wherein a plurality of active elements are formed over the substrate, column 9 lines 55-63.

As in claims 5, 18, and 27, Nito teaches of, wherein each of the plurality of active elements applies a voltage to the liquid crystal material, column 9 lines 55-63, and wherein the voltage has an upper limit, column 9 lines 25-40.

As in claims 35-37, Nito teaches of said liquid crystal material being driven by active matrix driving, column 9 lines 55-63.

As in claim 38, Nito teaches of wherein said black level is displayed by applying a voltage of OV to the liquid crystal material, figure 9a&b.

As in claim 39-41, Nito teaches wherein a quantity of light changes by changing a values of a voltage, column 9 lines 10-40, figure 9a&b.

As in claims 10, 23, and 32, Nito teaches voltages having an opposite polarity and same value, figure 9a&b. Wherein as applied to claim 10 said response times are inherent to said gray scale pulses having an first and second polarity portion.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. **Claims 12-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nito et al. (5214523) in view of Yamamoto et al. (5617229) and Kogushi et al. (5598284).**

As in claim 12, Nito et al. teaches of a method of driving a liquid crystal display device, said liquid crystal display device including: a plurality of thin film transistors being provided over a substrate, **column 9 lines 55-68**;

an orientation film over each of the plurality of thin film transistors, **column 3 lines 52-67, column 7 lines 30-45**;

and said liquid crystal material over the orientation film, said liquid crystal material having a spontaneous polarization, **column 3 lines 5-10**,

wherein a brightness of said liquid crystal material increases monotonically according to a voltage value applied to said liquid crystal, **column 8 lines 63-67, column 9 lines 1-40,**

the method comprising applying a voltage of OV to the liquid crystal material in a first period through a single thin film transistor of the plurality of thin film transistors, **figure 9a & b, column 9 lines 1-63**;

and performing a first gradation display in a second period through the single thin film transistor just after the first period, **figure 9a & b, column 9 lines 1-63,**

applying a voltage of 0V to the liquid crystal material in a third period through a single thin film transistor of said plurality of thin film transistors just after the second period, **figure 9a & b, column 9 lines 1-63**;

and performing a second gradation in a fourth period just after the third period through said single thin film transistor just after the third period, **figure 9a & b, column 9 lines 1-63.**

Wherein Nito shows in figure 9b a series of incrementally increasing gray scale pulses having a first and second portions of equal magnitude but opposite polarity, each pulse followed by the application of zero volts, such that gray scale pulses cause a corresponding gray illumination and the zero volts cause a black display which cancels polarization. Therefore Nito teaches of a sequence of applying zero voltages in a first period, followed by a two polarity gray scale pulse in a second period, followed by applying zero volts in a third period, followed by applying another incrementally higher two polarity gray scale pulse in a fourth period, followed by another zero volts in a fifth period, totally reading on the Applicants claimed invention.

However Nito et al. is silent as to said auxiliary capacitor being connected in series to each of the plurality of thin film transistors and of being connected in parallel to the liquid crystal.

Yamamoto et al. teaches of said capacitor, **figure 21 item LC, column 4 lines 3-28.** Yamamoto et al. teaches of a liquid crystal display as suggested by Nito and therefore the features of Nito are combinable with Yamamoto et al. for the purpose of enhancing the display with features as known in the art. Particularly said capacitor is known for use in ferroelectric matrix addressed display system. **Kogushi et al. further teaches of** an auxiliary capacitor connected in parallel to the liquid crystal for the purpose of positively effecting spontaneous polarization, figure 2 item 201, figure 6 item C, column 3 lines 40-50.

Therefore it would have been obvious to the skilled artisan to provide the capacitor as taught by Yamamoto in the system of Nito and parallel to the liquid crystal as taught by Kogushi because said capacitor is known for use in ferroelectric matrix addressed display system and assists positively with spontaneous polarization, as found in claim 12.

As in claim 13, Nito et al. teaches of, wherein a transmittance of the liquid crystal material is uniquely determined when voltages having a same absolute value and opposite polarities are applied thereto, figure 9(b).

As in claim 14, Nito el al. teaches of, wherein the liquid crystal material has a same tilt angle when voltages having a same absolute value and opposite polarities are applied thereto, figure 9(b).

As in claim 15, Nito et al. teaches of wherein the liquid crystal display material has a chiral smectic phase, column 3 lines 5-10.

3. **Claims 7-9, 11, 16, 20-22, 24, 25, 29-31, 33, and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nito e al. (5214523) in view of Saishu et at. (6069600).**

As in claims 7-9, 16, 20-22, 25, 29-31, and 34, Nito et al. teaches of the invention as applied to claims 1-3 and 12, however Nito is silent as to said combination of varying spontaneous polarization of the liquid crystal material being of a specific value and orientation film thickness.

Saishu et al. teaches of varying spontaneous polarization of the liquid crystal material, column 9 lines 15-25, column 12 lines 55-60, further wherein said

varying orientation film thickness would have been an obvious design choice in view of the range of values suggested by Saishu, further wherein said thickness values also represent obvious design choice thickness values available to the skilled artisan.

As in claims 11, 24, and 33, Saishu et al. teaches of the auxiliary capacitor well known in the art that Nito et al. is silent on, column 9 lines 15-25, column 12 lines 55-60.

Therefore it would have been obvious to the skilled artisan at the time of the invention to adapt said varying polarization and thickness values as suggested by Saishu in the device as suggested by Nito because both Nito and Saishu teaches of a drive technique an active matrix type liquid crystal display, as found in the above claims.

4. **Claims 6, 19, and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nito (5214523).**

As in claims 6, 19, and 28, Nito teaches of, wherein the upper limit of the voltage has an absolute value of 7 V or less, table 1, column 9 lines 25-40, wherein 11.1v is sufficiently close to 7v and would have been an obvious design choice.

Response to Arguments

5. Applicant's arguments filed on 10/17//2006 have been fully considered but they are not persuasive. Nito et al. teaches of a material having a chiral smectic phase of the V shaped electro-optical characteristic, column 3 lines 5-10, column 4 lines 19-20, column 9 lines 1-63. As in claim 12 Kogushi et al. further teaches of an auxiliary capacitor connected in parallel to the liquid crystal for the purpose of positively effecting spontaneous polarization, figure 2 item 201, figure 6 item C, column 3 lines 40-50, which would be the reason to provide for said feature in Nito in view of Yamamoto. Applicant argues Nito fails to teach of the claimed features. The Examiner disagrees. Wherein Nito shows in figure 9b a series of incrementally increasing gray scale pulses having a first and second portions of equal magnitude but opposite polarity, each pulse followed by the application of zero volts, such that gray scale pulses cause a corresponding gray illumination and the zero volts cause a black display which cancels polarization. Therefore Nito teaches of a sequence of applying zero voltages in a first period, followed by a two polarity gray scale pulse in a second period, followed by applying zero volts in a third period, followed by applying another incrementally higher two polarity gray scale pulse in a fourth period, followed by another zero volts in a fifth period, totally reading on the Applicants claimed invention. Rejection maintained.

Conclusion

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to **David L. Lewis** whose telephone number is **(571) 272-7673**. The examiner can normally be reached on MT and THF from 8 to 5. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bipin Shalwala, can be reached on **(571) 272-7681**. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (571)-273-8300.

7. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Examiner: David L. Lewis
March 19, 2007